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ALBERTA POPULATION GROWTH

SECOND QUARTER, 1987

Alberta

TREASURY
Bureau of Statistics



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SECOND QUARTER, 1987

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PREFACE

This publication presents up-to-date information on quarterly population estimates and population growth components (births, deaths and migration) for the province of Alberta. These statistics are derived using administrative data files obtained from several government agencies.

The second quarter report, as in past years, will provide an additional section on the age-sex composition of the June population and a more detailed description of methodology in the Appendix.

Data are also computer-accessible via ASIST (Alberta Statistical Information System) matrices #6128, 6130, 6140 and 6141. Enquiries concerning the publication or requests for additional copies or previous quarterly reports should be directed to:

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INTRODUCTION

This quarterly publication presents population estimates of Alberta for the second quarter of 1987. Intercensal revisions on population levels and components for 1986 are also incorporated. Detailed intercensal revisions for the 1981-86 period plus other historical data will be available in a forthcoming special edition.

Tables 1 to 4 provide details on population levels and growth components (births, deaths and migration), as well as population exchange between Alberta and other provinces. Accompanying these tables are three figures to illustrate trends in: (1) major population growth components, (2) gross flow of interprovincial migration, and (3) population exchange between Alberta and other provinces. To reduce rounding discrepancy between components and totals, a new rounding format has been introduced which rounds to the nearest ten rather than the nearest hundred, as previously.

In response to users' requests a new table, Table 5, has been introduced to provide population data based on a June 1, census year, reference period. As a regular feature, this second quarter report includes a section with data on the age-sex composition of the population (Table 6). Finally, a detailed description of methodology is given in the appendix.

REVIEW OF THE DATA

Alberta's population continued to grow in the second quarter. Although the province experienced a net outflow of inter-provincial migrants during this period, this was more than offset by natural increase plus international migration. A review of the province's age structure shows a continued aging of the population.

More specifically:

- Alberta's population grew by 3,310 during the second quarter, about one third less than the growth of 5,200 recorded in the previous quarter (Figure 1 and Table 1).
- The reduced second quarter growth reflects a rise in net interprovincial migration from a first quarter outflow of 3,270 to 6,050 in the second quarter. Migration flows normally increase in the second quarter compared to the first due to seasonal fluctuations (Figure 2 and Table 2).
- During the quarter, Alberta received 12,520 in-migrants from other provinces while 18,570 out-migrants left for other provinces. British Columbia continued to be the main province of origin for in-migrants 4,600 (36.7%) and also the main destination for our out-migrants 6,960 (37.5%) (Figure 3 and Table 3).
- The population loss from interprovincial migration was more than offset by other growth components. Net international migration (immigrants less emigrants) accounted for 1,650 persons. In addition, natural increase (births minus deaths) added 7,710 persons to the population (Table 4).

- On a yearly basis, July to July, the population grew by 4,130 to a level of 2,380,700 on July 1, 1987. Growth of 8,510 in the first half of 1987 offset the population decline of 4,380 recorded the latter half of 1986.
- During the past year, the shift in the population age structure to an increasing number of elderly continued. The 65-and-over age group rose to 8.4% in the current year from 8.1% (Table 6).
- The aging of Alberta's population is further reflected by an increase in the median age from 29.2 to 29.5 during the past year. This aging trend was the result of the baby boomers growing older.
- Although the birth rate has continued to decline, the number of children in Alberta has increased because so many baby boomers are still in their prime childbearing years. As a result, the age group 0-14 expanded slightly to 23.9% from 23.7% (Table 6).
- The proportion of the working-age group (15-64) shrank to 67.7% from 68.2%. While the labour market entrants group (aged 15-24) decreased from 17.2% to 16.6%, the older working-age group (aged 25-64) expanded marginally from 51.0% to 51.1%.
- The changing pattern of the age structure is also reflected by the child and elderly dependency ratios. These ratios represent the proportion of population 0-14 and 65+ to the working-age population aged 15-64. The child dependency ratio increased from 34.8% to 35.2%; and the old age dependency ratio rose from 11.9% to 12.5%.

FIGURE 1

POPULATION GROWTH WITH MAJOR COMPONENTS ALBERTA 1986-1987

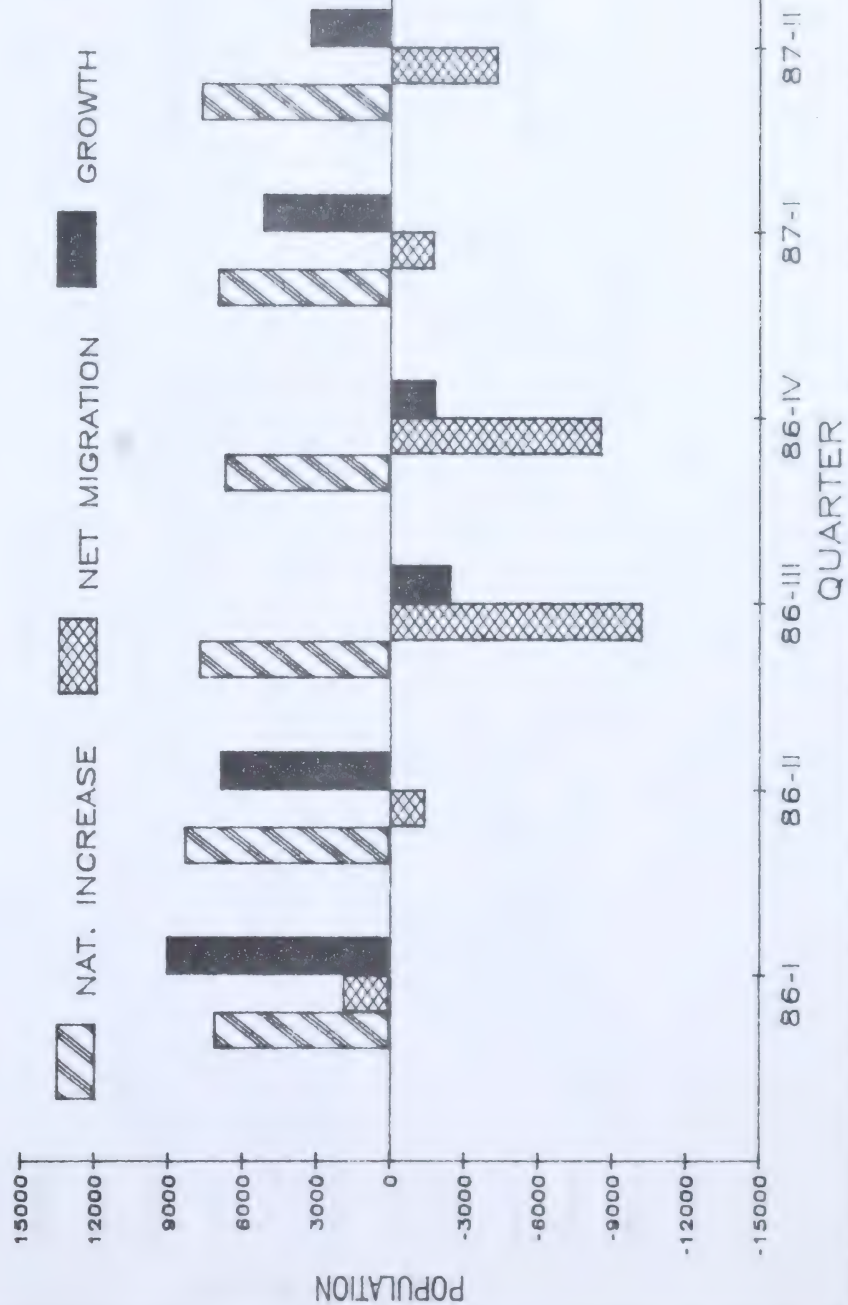


FIGURE 2

QUARTERLY INTERPROVINCIAL MIGRATION ALBERTA 1986-1987

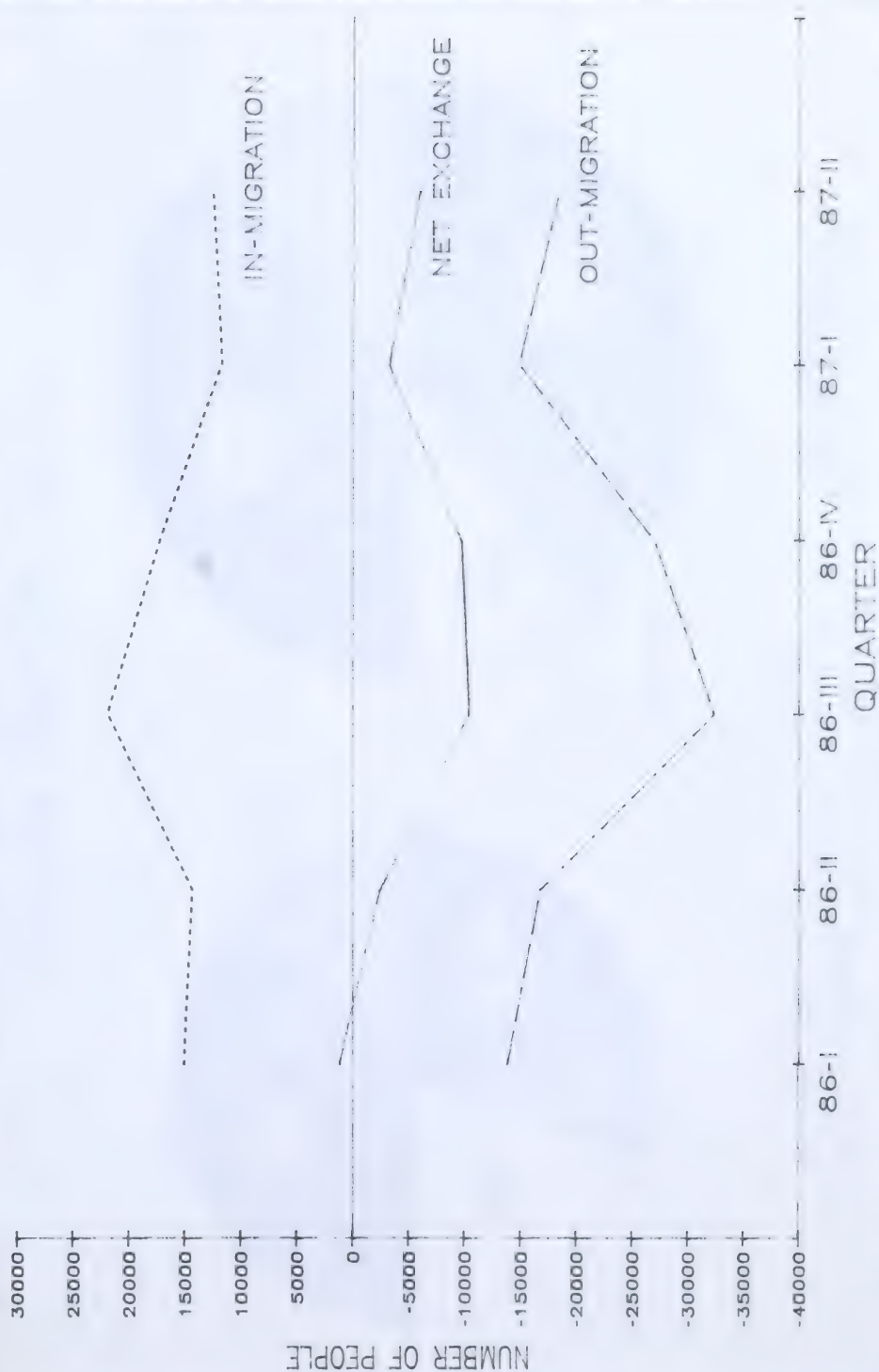
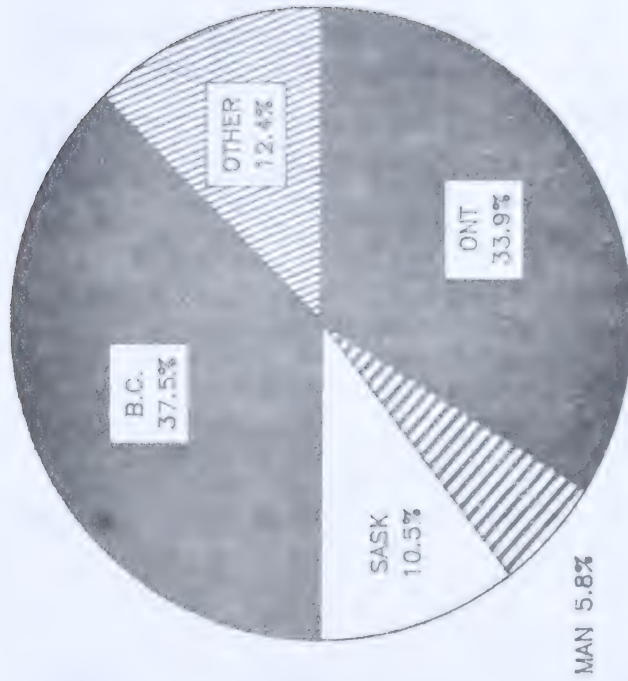
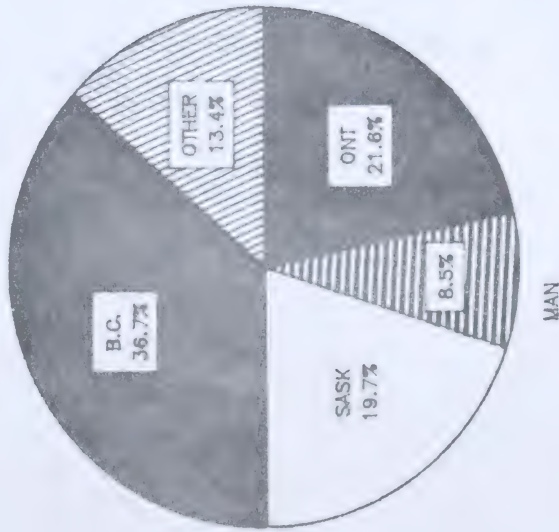


FIGURE 3

POPULATION EXCHANGE
ALBERTA AND OTHER PROVINCES
SECOND QUARTER 1987



OUT-MIGRATION
(18,570 PERSONS)



IN-MIGRATION
(12,520 PERSONS)

TABLE 1
POPULATION GROWTH BY MAJOR COMPONENT
ALBERTA, 1986 to 1987

Quarter	Natural Increase	Net Migration	Growth	Population
<u>1986</u>				
I ^r	7,170	1,910	9,080	2,369,700
II ^r	8,360	-1,460	6,900	2,376,600
III	7,760	-10,270	-2,510	2,374,100
IV	6,740	-8,610	-1,870	2,372,200
TOTAL	30,030	-18,430	11,600	2,372,200
<u>1987</u>				
I ^r	7,020	-1,820	5,200	2,377,400
II ^p	7,710	-4,400	3,310	2,380,700

Notes: Reference date for population is the first day of the subsequent quarter.
Data may not add to totals due to rounding.
r: revised
p: preliminary

TABLE 2
MIGRATION BY COMPONENT
ALBERTA, 1986 to 1987

Quarter	International			Interprovincial		
	Im- migration	Em- igration	Net	In Migration	Out Migration	Net
<u>1986</u>						
I ^r	2,190	1,430	760	15,020	13,870	1,150
II ^r	2,450	1,430	1,020	14,350	16,830	-2,480
III	2,440	2,240	200	21,940	32,410	-10,470
IV	2,400	1,240	1,160	17,200	26,970	-9,770
TOTAL	9,480	6,340	3,140	68,510	90,080	-21,570
<u>1987</u>						
I ^r	2,360	910	1,450	11,650	14,920	-3,270
II ^p	2,750	1,100	1,650	12,520	18,570	-6,050

Notes: Data may not add to totals due to rounding.
r: revised
p: preliminary

TABLE 3

POPULATION EXCHANGE WITH OTHER PROVINCES
ALBERTA, 1986 to 1987

Quarter	Migration	NFLD	PEI	NS	NB	QUE	ONT	MAN	SASK	BC	TERR	TOTAL
1986												
I												
	To Alta.	380	60	470	330	350	3390	920	2370	6310	440	15020
	From Alta.	190	60	370	180	650	4610	760	1820	4980	260	13370
	Net Exchange	190	0	100	150	-300	-1220	160	550	1330	180	1150
II												
	To Alta.	350	60	480	290	440	3000	990	2570	5780	400	14350
	From Alta.	290	70	580	330	720	5690	1060	1770	5980	350	16830
	Net Exchange	60	-10	-100	-40	-280	-2690	-70	800	-200	50	-2480
III												
	To Alta.	460	140	870	600	960	5140	1710	3930	7560	580	21940
	From Alta.	840	120	1020	680	1450	12550	1810	2830	10570	550	32410
	Net Exchange	-380	20	-150	-80	-490	-7410	-100	1100	-3010	30	-10470
IV												
	To Alta.	300	40	720	310	650	3310	1400	3030	6820	620	17200
	From Alta.	450	110	840	360	1180	10440	1570	2660	8850	500	26970
	Net Exchange	-150	-70	-120	-50	-530	-7130	-170	370	-2030	120	-9770
TOTAL												
	To Alta.	1490	300	2540	1530	2400	14840	5020	11900	26470	2040	68510
	From Alta.	1770	360	2810	1550	4000	33290	5200	9080	30380	1660	90080
	Net Exchange	-280	-60	-270	-20	-1600	-18450	-180	2820	-3910	380	-21570

TABLE 3 (continued)
POPULATION EXCHANGE WITH OTHER PROVINCES
ALBERTA, 1986 to 1987

Quarter	Migration	NFLD	PEI	NS	NB	QUE	ONT	MAN	SASK	BC	TERR	TOTAL
1987 I ^r	To Alta.	300	20	360	200	250	2830	980	2070	4320	310	11650
	From Alta.	150	30	380	180	600	5580	850	1540	5220	400	14920
	Net Exchange	150	-10	-20	20	-350	-2750	130	530	-900	-90	-3270
IIP	To Alta.	340	110	260	250	420	2710	1060	2470	4600	300	12520
	From Alta.	280	90	500	310	680	6290	1080	1950	6960	440	18570
	Net Exchange	60	20	-240	-60	-260	-3580	-20	520	-2360	-140	-6050

Notes: Data may not add to totals due to rounding.

Estimates are based on family allowance transfer statistics, Health and Welfare Canada.

r: revised

p: preliminary

TABLE 4
NATURAL INCREASE BY COMPONENT
ALBERTA, 1986 to 1987

Quarter	Births	Deaths	Natural Increase
<u>1986</u>			
I ^r	10,660	3,490	7,170
II ^r	11,760	3,400	8,360
III	11,040	3,280	7,760
IV	10,210	3,470	6,740
TOTAL	43,670	13,640	30,030
<u>1987</u>			
I ^r	10,310	3,290	7,020
II ^p	11,120	3,410	7,710

Notes: Data may not add to totals due to rounding.
r: revised
p: preliminary

TABLE 5

POPULATION GROWTH BY CENSUS YEAR, BY COMPONENT
ALBERTA, 1986 TO 1987

POPULATION 1986 (June 1)		2,375,300
COMPONENTS OF GROWTH		
Migration		
Interprovincial		
In-migration	63,290	
Out-migration	<u>92,200</u>	
Net migration	-28,910	
International		
Immigration	9,980	
Emigration	<u>5,740</u>	
Net migration	4,240	
Total Net Migration	-24,670	-24,670
Births	42,700	
Deaths	<u>13,410</u>	
Natural Increase	29,290	<u>29,290</u>
ANNUAL GROWTH		4,620
POPULATION 1987 (June 1)		2,379,900

TABLE 6

POPULATION ESTIMATES* BY FIVE-YEAR AGE GROUP AND SEX, ALBERTA

June 1, 1987

June 1, 1986

Age	Male			Female			Total			Male			Female			Total		
	No.	%		No.	%		No.	%		No.	%		No.	%		No.	%	
0-4	106,000	8.9		100,700	8.5		206,700	8.7		105,000	8.8		100,000	8.5		205,100	8.7	
5-9	96,300	8.1		91,400	7.7		187,700	7.9		94,400	7.9		89,300	7.6		183,700	7.8	
10-14	88,900	7.4		84,500	7.1		173,300	7.3		88,600	7.4		84,000	7.2		172,600	7.3	
15-19	93,100	7.8		89,100	7.5		182,200	7.7		92,900	7.8		89,300	7.6		182,200	7.7	
20-24	105,300	8.8		108,400	9.2		213,700	9.0		112,200	9.4		112,700	9.6		224,900	9.5	
25-29	126,400	10.6		124,800	10.6		251,200	10.6		130,000	10.9		125,800	10.7		255,700	10.8	
30-34	120,900	10.1		114,100	9.6		235,000	9.9		118,000	9.9		111,100	9.5		229,100	9.7	
35-39	97,200	8.1		92,400	7.8		189,600	8.0		96,800	8.1		92,700	7.9		189,500	8.0	
40-44	76,000	6.4		73,100	6.2		149,100	6.3		71,900	6.0		68,800	5.9		140,700	5.9	
45-49	58,300	4.9		55,600	4.7		114,000	4.8		57,600	4.8		55,000	4.7		112,600	4.8	
50-54	52,000	4.4		49,200	4.2		101,300	4.3		53,000	4.4		49,700	4.2		102,600	4.3	
55-59	48,500	4.1		45,900	3.9		94,400	4.0		48,400	4.1		46,100	3.9		94,500	4.0	
60-64	39,500	3.3		41,400	3.5		81,000	3.4		39,300	3.3		42,000	3.6		81,400	3.4	
65-69	31,500	2.6		36,000	3.0		67,500	2.8		30,400	2.6		34,800	3.0		65,100	2.8	
70-74	23,800	2.0		29,100	2.5		52,900	2.2		23,100	1.9		28,300	2.4		51,400	2.2	
75-79	16,200	1.4		21,100	1.8		37,300	1.6		15,500	1.3		20,300	1.7		35,800	1.5	
80-84	10,100	0.8		14,200	1.2		24,300	1.0		9,500	0.8		13,200	1.1		22,600	1.0	
85-89	4,600	0.4		7,700	0.7		12,300	0.5		3,900	0.3		7,000	0.6		10,900	0.5	
90+	2,200	0.2		4,300	0.4		6,500	0.3		1,800	0.2		3,600	0.3		5,400	0.2	
Total	1,196,600	100.0		1,183,300	100.0		2,379,900	100.0		1,192,000	100.0		1,173,800	100.0		2,365,800	100.0	

Notes: * Age and sex distributions for 1987 are based on Alberta Health Care Registrations. For 1986 the distributions are based on 1986 Census data which exclude one or more incompletely enumerated Indian reserves or Indian settlements. Caution should therefore be taken when making comparison of age-sex numbers between the census counts and the 1987 estimates.

Data may not add to totals due to rounding.

APPENDIX

METHODOLOGY

Introduction

These estimates are derived using information from administrative data files obtained from the following government agencies:

- 1) birth and death registrations from Vital Statistics Section, Alberta Community and Occupational Health;
- 2) family allowance transfer counts from Income Security Branch, Health and Welfare Canada;
- 3) immigration statistics from Employment and Immigration Canada;
- 4) migration adjustment factors and population estimates for other provinces from Demography Division, Statistics Canada; and
- 5) health care registration data from Alberta Hospitals and Medical Care.

The final estimates are produced using a component method. A description of the basic methodology and the procedures used in estimating each of the population growth components, as well as the age-sex structure is presented in the following sections.

The Component Method

The component method of estimating quarterly population growth employs the population of a previous quarter as a base, and adds the natural increase plus net migration to derive the population estimates for the following quarter. Natural increase is obtained by subtracting deaths from births. Net migration is obtained by aggregating net interprovincial (in-migration minus

out-migration) and net international migration (immigration minus emigration). These are then combined to derive an estimate of population growth. The general formulas used are as follows:

$$P_{t+1} = P_t + NI_{t+1} + NM_{t+1}$$

$$NI_{t+1} = B_{t+1} - D_{t+1}$$

$$NM_{t+1} = (MI_{t+1} - MO_{t+1}) + (I_{t+1} - E_{t+1})$$

Where,

P_t = Population at time of t

NI_{t+1} = Natural Increase during time interval t to $t+1$

B_{t+1} = Number of births during time interval t to $t+1$

D_{t+1} = Number of deaths during time interval t to $t+1$

NM_{t+1} = Net migration during time interval t to $t+1$

MI_{t+1} = Number of in-migrants to Alberta from the
rest of Canada during time interval t to $t+1$

MO_{t+1} = Number of out-migrants from Alberta to the
rest of Canada during time interval t to $t+1$

I_{t+1} = Number of immigrants to Alberta from abroad
during time interval t to $t+1$

E_{t+1} = Number of emigrants from Alberta to abroad
during time interval t to $t+1$

Natural Increase

Natural increase is calculated as the difference between the number of births and the number of deaths that occurred during a specific quarter. Preliminary estimates on births and deaths are produced using birth and death rates. The average quarterly crude birth rate and the crude death rate of the preceding year are applied to the estimated provincial population at the beginning of the period to derive the estimated number of births and deaths. These estimates will be replaced by actual counts in a subsequent quarterly report when final vital statistics data are available from Vital Statistics Section, Community and Occupational Health. These data on births and deaths are about 98% accurate.

Interprovincial Migration

To estimate interprovincial migration, family allowance transfer of accounts are used in conjunction with the latest adjustment factors and child-adult ratios. Since family allowance cheques are mailed to the families monthly, there is incentive for these families to report any change in their address. The time lag in reporting such change is usually very small. Over the years family allowance transfer of accounts data have been an accurate source of the movements of children among the provinces.

The procedures used in estimating interprovincial migration for Alberta are further improved by incorporating additional information from tax records migration data. Net interprovincial migration (MP) is derived as the balance of

in-migration (MI) and out-migration (MO):

$$MP = MI - MO$$

In-migration (MI) is estimated as the sum of:

$$MI = \sum_{k=1}^{10} (I_{ck} + I_{ak})$$

Where I_{ck} is the number of child-migrants from province k to Alberta obtained from family allowance, and I_{ak} is the number of adult-migrants from province k to Alberta estimated as follows:

$$I_{ak} = I_{ck} \cdot R_k \cdot F_{ik}$$

Where R_k is the adult-child ratio of the province of origin k , and F_{ik} is the adjustment factor for in-migration, i.e., the ratio of adult in-migration rate to the child in-migration rate as derived from tax record migration information. The adjustment factors, as mentioned, are obtained from Demography Division, Statistics Canada.

Out-migration (MO) is estimated as:

$$MO = \sum_{k=1}^{10} (O_{ck} + O_{ak})$$

Where O_{ck} is the number of child-migrants from Alberta to province k . This is obtained from family allowance transfer of accounts data. O_{ak} is the number of adult-migrants from Alberta to province k . It is calculated as follows:

$$O_{ak} = O_{ck} \cdot R \cdot F_{ok}$$

Where R is the adult-child ratio of Alberta, and F_{Ok} is the adjustment factor for out-migration supplied by Demography Division, Statistics Canada.

The adult-child ratios and the adjustment factors for in-migration (F_I) and out-migration (F_O) used in the computation of interprovincial migration are provided in Table A.

Table A
Adult Child Ratios and Migration Adjustment Factors by Province

	Adult-child ¹ Ratio	Adjustment F_I	Factor ² F_O
Newfoundland	2.1146	1.3466	0.9164
Prince Edward Island	2.5248	1.2451	1.0164
Nova Scotia	2.7915	1.0141	1.0932
New Brunswick	2.5831	1.0491	0.9054
Quebec	3.0293	1.3141	1.1586
Ontario	2.9838	1.0714	0.9975
Manitoba	2.7186	1.0198	0.9814
Saskatchewan	2.4383	1.0882	0.9075
Alberta	2.5283	--	--
British Columbia	3.0071	0.9881	1.1961
Yukon	2.3129	0.8491	0.9384
N.W. Territories	1.5744	1.6087	1.0753

Sources: 1. Data derived from 1986 Census counts.

2. Unpublished data provided by Demography Division, Statistics Canada.



Immigration

The estimate of immigration is first produced on a preliminary basis and then revised when immigration statistics become available. Preliminary estimates are derived taking into consideration the expected number of immigrants to be admitted to Canada in a certain year as announced by Employment and Immigration Canada. Based on the historical immigration records a ratio is derived to estimate Alberta's share of the total immigrants coming to Canada.

The final estimate of immigrants coming to Alberta are based on statistics compiled from immigration papers which each immigrant submits to the Canadian authority at the port of entry. The immigration papers contain information on the intended place of destination and the place of origin of the immigrant. Since this information is available monthly, the quarterly estimate of immigrants intending to come to Alberta can be calculated. These revised figures are obtained by the subsequent quarter and thus the current quarterly publication updates the previous preliminary estimates.

Emigration

Emigration estimates are derived from a method developed by Statistics Canada in which an adjustment factor is developed from emigration information retrieved from personal income tax files. This adjustment factor is applied to the number of family allowance accounts which have been transferred out of the country during the quarter to obtain the emigration estimate. For 1987, the adjustment factor used is 0.856203 which is derived from personal income tax files for 1985, the most recent available.



An adult-child ratio based on 1986 Census data records is then applied to estimate the number of adult emigrants. The sum of estimated adult emigrants and child emigrants, as indicated by family allowance data, equals to the total number of estimated emigrants.

Age-Sex Structure

Age and sex distributions for the January 1 and June 1 estimated population are derived by applying the proportionate age and sex distributions as recorded in the Alberta Health Care Insurance Plan (AHCIP) Master Registration File. Although the health care records are subject to certain limitations such as reporting error, time lags and administrative changes, the age and sex distributions of registrants have proven to accurately reflect the most current age-sex structure of the Alberta population.

Limitations of the Population Estimates

Overall, the population change due to natural increase is most reliable, since the birth and death registration records are virtually 100% complete. Of the other components of population change, migration estimates are more prone to error due to the limitations of the administrative data files used. Family allowance, health care and tax records, however, have historically proven to be an excellent information sources on population and migration.

Alberta Bureau of Statistics has investigated the characteristics of each of these data files, to identify problem areas and to develop modifications in the methodology to minimize the effects of any problems on the population estimates. To this end, Alberta Bureau of Statistics has worked closely with Demography Division, Statistics Canada and will continue to monitor and test latest developments in population estimation methodology.



GLOSSARY

Birth Rate, or Crude Birth Rate - the number of births in a year divided by the total population.

Child Dependency Ratio - the ratio of children under 15 to working-age persons between the ages of 15 and 64.

Death Rate, or Crude Death Rate - the number of deaths in a year divided by the total population.

Emigration - the migration of population out of a country to another country.

Fertility - the contribution of births to population change.

Immigration - the migration of population into a country from another country.

In-migration - the migration of population into a geographical area.

Median Age - the age at which the population is divided into equal halves, such that one half of the population is older than the median age and the other half of the population is younger than the median age.

Migration - a permanent change of residence from one geographical area to another.

Natural Increase - the net contribution of births less deaths to population change.

Net Migration - the difference between in-migration and out-migration for a geographical area.

Old Age Dependency Ratio - the ratio of persons aged 65 years and over to working-age persons between the ages of 15 and 64.

Out-migration - the migration of population out of a geographical area.

GLOSSARY

Birth Rate, or Crude Birth Rate - the number of births in a year divided by the total population.

Child Dependency Ratio - the ratio of children under 15 to persons aged 15 and over.

Death Rate, or Crude Death Rate - the number of deaths in a year divided by the total population.

Emigration - the migration of population out of a country to another country.

Fertility - the contribution of births to population growth.

Immigration - the migration of population into a country from another country.

Intermigration - the migration of population into a geographical area.

Median Age - the age at which the population is divided into equal halves, with half the population below and half above the median age.

Migration - a movement of population from one geographical area to another.

Natural Increase - the net contribution of births less deaths to population change.

Net Migration - the difference between immigration and emigration for a geographical area.

Old Age Dependency Ratio - the ratio of persons aged 65 years and over to working-age persons between the ages of 15 and 64.

Out-migration - the migration of population out of a geographical area.

